

AYK REGION
NORTON SOUND/KOTZEBUE
ESCAPEMENT REPORT #27

KOBUK RIVER CHUM SALMON
ESCAPEMENT ASSESSMENT STUDIES
1982

by

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INTRODUCTION

Chum salmon are the most abundant species of salmon in the Kotzebue Sound drainage. The largest stocks contributing to the Kotzebue salmon fishery, spawn in the Noatak and Kobuk Rivers. The Kobuk River stocks are less abundant and are utilized to a greater extent by subsistence fishermen.

Managers currently believe that Kobuk River stocks are the most susceptible to overharvest, consequently current management strategy attempts to afford relatively more protection to them. Commercial fishing effort is restricted by regulation to two 24 hour periods per week in July when a large proportion of the Kobuk River stocks are passing through the commercial fishing district near Kotzebue.

Tagging data, compiled during 1981, however, indicate that those salmon stocks which spawn in the upper Kobuk River, generally pass through the commercial fishery during August when commercial fishing effort is less restricted. Not only is there more commercial fishing pressure on this segment, but more subsistence fishing pressure as well. Since all of the five Kobuk River villages have a large dependence on salmon for food and since statutory law designates subsistence use of these fish as first priority among uses, the salmon run of the upper Kobuk River is of great management concern and warrants close monitoring.

Precise information on the timing, size and subsistence utilization of Kobuk River salmon stocks are needed for further refinement of management goals and strategy. Until now, location and size of areas used as spawning habitat have not been precisely documented. Information on run size and the magnitude of subsistence catches have been sketchy at best.

Escapement estimates, by aerial survey method, have been attempted on the Kobuk River since statehood. This remains the most economic and expedient method of estimating escapements in the Kobuk River. A counting tower was operated in 1982 for the first time, on the Squirrel River about 45 miles above Kiana. The purpose of this counting tower project was to document run timing and magnitude on a daily basis in this tributary and also to evaluate the accuracy of aerial surveys. The results of this project are presented in a separate report.

The purpose of this study is to document run size and location of spawning habitat in that portion of the Kobuk River above the village of Kobuk.

METHODS

The aerial survey was conducted in areas where most of the chum salmon are thought to spawn. The survey took place in a Piper super cub, flying approximately 500 feet above the ground at about 60 miles per hour. Observers used polaroid sunglasses to help reduce glare. Data was recorded in 2 ways. Large concentrations of spawning salmon were either marked on maps when time allowed, or recorded on a dictaphone and transcribed later. The aerial survey was scheduled to coincide with probable peak spawning periods. Survey scheduling was also affected by the availability of suitable weather, planes and pilots.

The upper Kobuk River was also surveyed by a two man crew in a rubber raft. This ground reconnaissance was made after first pinpointing large concentrations of fish from the air. Spawning areas were noted in field notes. Searches for salmon tags were conducted in conjunction with the Kotzebue tagging project. Interviews with subsistence fishermen were conducted as part of the annual subsistence survey project.

RESULTS

Although two aerial surveys were planned for the upper Kobuk watershed, time constraints and bad weather limited the actual number of surveys to one on August 26. An estimated 14,600 salmon were observed, most of which were spawning. In retrospect this survey probably occurred before the seasonal peak in chum salmon occurred. Survey conditions were rated good.

A ground reconnaissance was initiated on 11 September and confirmation of most spawning areas, seen from the air, was attempted. By September 14 heavy rains and rising water resulted in muddy water and poor visibility. A total of 5,730 spawning chum salmon was observed during this ground on the upper Kobuk River. Referring to the maps (figures 1 and 2) the following spawning areas were observed both from the ground and from the air.

Location (# on map)	Aerial count of spawners	Aerial survey date	Ground survey count of spawners	Date observed on ground
4	300	8/26	50	9/15
5	1,000	8/26	35	9/15
6	2,000	8/26	2,700	9/14
7	300	8/26	235	9/14
12	300	8/26	700	9/13
14	300	8/26	600	9/13
16	500	8/26	720	9/12
	<hr/>		<hr/>	-
Totals	3,700	-	5,040	-

The following spawning areas were observed from the air only.

Location (# on map)	Aerial count of spawners	Aerial survey date	Comments
1	450	8/26	muddy water during boat survey
2	300	8/26	" " " " "
3	500	8/26	" " " " "
8	600	8/26	inadvertently omitted during ground survey
9	250	8/26	" " " " "
10	1,200	8/26	" " " " "
11	1,400	8/26	" " " " "
17	75	8/26	ground crew did not get this far upstream
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Totals	4,700		

A total of 375 spawning salmon were observed during a foot survey of the lowest half miles of Beaver Creek, on September 13. No spawners were observed in this location during the aerial survey conducted here on August 26.

During the ground survey, one king salmon carcass was found on the upper Kobuk River 10 or 12 miles above the mouth of the Selby River. With this exception, no evidence was found of other species of salmon.

DISCUSSION AND RECOMMENDATIONS

The list of spawning areas, presented above, does not imply that all areas have been identified. Local inhabitants of the upper Kobuk River are aware of many salmon spawning tributaries that are not surveyed routinely by the Department of Fish and Game. Investigation of these streams should be attempted in the future. They include:

Upper Selby River, Selby Lake and Selby Lake drainage
Beaver River
Pah River (not usually surveyable from the air, a ground survey is necessary)
Kogalluktuk River
Shungnak River
Ambler River
Maneluk River

An estimated 14,674 chum salmon were observed from the air on August 26 in the upper Kobuk River. The validity of comparing this figure with estimates made during past years is questionable, because of the strong effect varying survey conditions can have on escapement estimates in this area. Many surveys in past years were incomplete or conducted under marginal conditions. Although the 1982 estimate is high when compared to the last few years (table 2) it must be noted that the survey was made under good conditions.

Although the aerial survey counts were high in 1982 in the upper Kobuk River, escapement estimates in the Squirrel, Salmon and Tutuksuk rivers were below average, (table 1) when compared to past years. An estimated 7,610 chum salmon were seen from the air in the Squirrel River above the tower site under fair conditions on August 24 which was 5 days after the tower project terminated. The cumulative escapement estimate, based on tower data collected through August 19, was 9,500 chum salmon. Since most salmon observed from the air were spawners and there were almost no fish in this river below the tower it is unlikely that many salmon passed the tower site between the dates the tower project ceased and the aerial survey was conducted and those two estimates should be comparable.

Ground reconnaissance surveys are costly and take a lot of time to complete. The two man crew surveyed as much of the Kobuk and it's tributaries as possible in 1982 with a rubber raft and outboard, between the village of Kobuk and the lower canyons, a distance of 140 miles. The crew spent a week in the study area without examining all the possible spawning areas. The large investment in time is necessary, mostly to travel the long distances involved between spawning areas.

Selby Slough was the most important spawning area observed on the upper Kobuk River in 1982. It is located on the north side of the Kobuk River, about a mile above the mouth of Selby River. Salmon redds covered almost the entire bottom. Numerous carcasses were observed half buried in other redds. It is probable that salmon were spawning on top of each other.

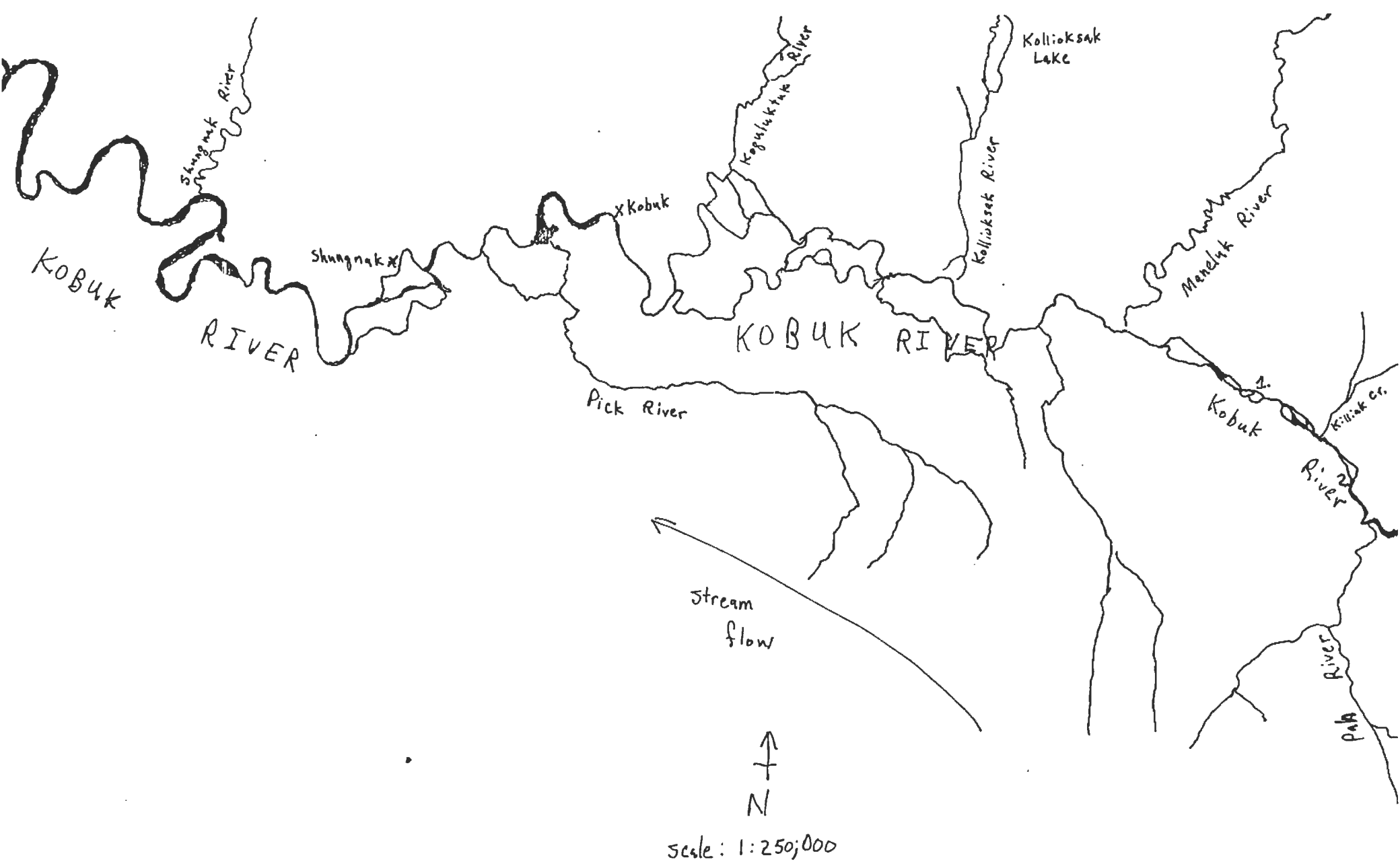
Areas containing less than 50 spawners were not listed on the map. Spawning distribution generally seemed clumped into the areas mentioned. Other salmon, seen from the air and ground were still migrating and were not listed on the map. It is highly likely that the ground survey would have been more successful had the rain and flooding not occurred. By the time the field crew reached the Selby River water visibility was less than six inches. The timing of the float trip (9/11-17) was probably slightly early to observe peak spawning concentrations of salmon.

Table 1. Comparative chum salmon aerial survey escapement estimates, Kobuk River drainage.

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
<u>Upper Kobuk River</u>										
Kobuk to Pah River	-	-	1843	372	-	269	75	1694	18	1643 1/
Pah River to just below Selby River	-	4710	3940	1432	-	1448	183	2063	309	583
Selby River mouth to slough including Selby River	-	7380	2284	-	-	211	1110	6925	-	4454
Just above Selby slough to just below Beaver River	920	13775	2291	-	-	53	640	784	8321 /2	5268
Beaver River and River mouth area	850	1444	-	-	-	-	-	-	-	0
Above Beaver River mouth	700	-	-	-	-	-	-	-	-	1711
Upper Kobuk River TOTAL	2470 1/	27309	10358	1804 1/	-	1981	2008	11466	8648	14674
<u>Tributaries</u>										
Squirrel River	12345	32523	34236	6929	1964 1/	1863	1500 1/	13536	9854	7690
Salmon River	6891	29190	8221	1161	-	814	738 1/	8456	4709	1240
Tutuksuk River	-	5265	1344 1/	758	-	368	382 1/	1165	1114	1322
Kobuk River System TOTALS	21706	94287	52179	11370	1758	5026	4628	34623	24325	24936

1/ incomplete survey or marginal survey conditions.

2/ probably includes some sheefish.



Salmon spawning areas observed in 1982. Figure 1.

Salmon spawning areas observed in 1982. Figure 2.

scale 1 : 250,000

North
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